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PATENT

Attorney Docket No. JACOB100/F7-5537



IN THE UNITED STATES PATENT AND TRADEMARK

In Re application of:

James D. Jacobson

Serial No. 09/457,173

Filed: December 8, 1999

Group Art No.: 1723

Examiner: Sun U. Kim

For:

MICROPOROUS FILTER MEMBRANE
METHOD OF MAKING
MICROPOROUS FILTER MEMBRANE
AND SEPARATOR EMPLOYING
MICROPOROUS FILTER
MEMBRANES

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RESPONSE TO OFFICE ACTION OF JANUARY 29, 2002

This is in response to the Office Action of January 29,
2002, which rejected all of the pending claims 1-5, 14-30 and
102 under 35 USC § 112 and 35 USC § 103.

The meaning of "monolithic" is fundamental to the rejection
of the pending claims under 35 U.S.C. § 112 and § 103. In the
present application, "monolithic" is consistently defined as

including either (1) a membrane in which the filter and support are made from a single sheet of film or (2) a membrane in which the filter and support begin in different films that are cured together to chemically bond, or cross-link, to form a single structure without a discernible line of distinction between them.

As set forth on page 16, lines 12-15, of the specification, for example, it is indicated that the monolithic filter and support layers of the claimed membrane "may be formed from a single polymeric film or from different films that are joined together to form a monolithic filter membrane." Beginning at page 16, line 26 the specification further states that "the filter membrane may be made monolithic by forming the filter and support layers from a single film or from separate films of the same or sufficiently compatible materials to allow the layers to become monolithic when bonded together."

When formed of two or more layers, the layers are joined in a non-fully cured state and then cured to form a monolithic filter membrane, as described at Page 21, Line 32: "To form the monolithic filter membrane, the first and second polyimide layers, which are not fully cured, are cured together to remove any interface therebetween and create the monolithic filter

membrane, which is then removed silicon wafer or other substrate" [emphasis added].

Such a process is described more fully at page 36 beginning at line 10: "The remaining [not fully cured] polyimide layers are then subjected to a final cure at a full bake temperature such as 400°F for a period of hours to fully cure the polymeric material. Because the filter and support layers were not previously fully cured and are of compatible polymeric materials, during the curing process the layers chemically bond or cross link, and the previous line of distinction between the layers disappears, and a monolithic filter membrane is formed as best seen in Figure 12g."

Accordingly, a "monolithic" membrane of the present invention is one in which the filter and support layers appear to have been made from a single sheet or film and have no discernible line of distinction between them -- because, for example, they are actually formed from the same sheet or film in the first place or they are formed of separate sheets or layers which are of the same or of sufficiently compatible materials that when joined, such as in a non-fully cured state and subsequently cured, they chemically bond or cross-link to form a single monolithic membrane with no discernible line of distinction to the observer.

**The Prior Art Does Not Teach the
Claimed "Monolithic" Filter Membrane**

The Examiner has previously recognized that U.S. Patent No. 5,733,014 to Van Rijn does not reach a "monolithic" filter membrane as required by the claims. In the most recent Office Action, the Examiner has relied upon U.S. Patent No. 5,275,725 to Ishii as teaching such a monolithic membrane.

It is respectfully submitted that upon reconsideration it will be clear Ishii does not teach or suggest a monolithic membrane as claimed, either alone or in combination with the Van Rijn patent.

First, it is pointed out that the filter structure shown in the Ishii Patent No. 5,275,725 is clearly one in which the filter is made of separate and distinct layers with discernible lines of distinction. As described in the Ishii patent, the filter membrane is made of several layers -- an interwoven core, non-woven random fiber mat intermediate layers and a polymeric outer layer adhesively bonded or heat fused. It is not understood how the Examiner can reasonably argue that this represents a "monolithic" filter membrane as that term is defined in the present application. By definition, it would seem that one inspecting the Ishii filter and seeing an interwoven core, a non-woven random fiber mat and a polymeric

outer layer, would immediately know that these are separate layers, independently formed, and with clear lines of distinction between them.

There is no teaching or suggestion in Ishii of making the filter structure described there from the same original sheet or film or from separate films that are joined in a non-fully cured state and then fully cured to form a single filter membrane and support structure with no discernible line of distinction. Indeed, it is not seen how the woven and random fiber mats of Ishii could conceivably be argued to be the same as or comparable to filter membrane made from one or more sheets or film without a line of distinction between the layers -- such that the resulting membrane appears to have been fashioned from a single sheet or membrane, i.e., monolithic.

In sum, the claimed "monolithic" membrane of the present invention is very different from the filter obtained in the Ishii patent. Regardless of whether the filter layers in Ishii are adhesively bonded or heat fused, the resultant filter would clearly have been made from separate and different layers that are separately formed and fixed together in some fashion at a later time. No one would confuse an inner woven core, non-woven random fiber mat intermediate layers and polymeric outer layer

with a filter structure of the present invention that appears to have been made from the same original sheet or film.

Van Rijn and Ishii are not Combinable

There simply is no suggestion or teaching in the Ishii reference that would logically lead one to combine the features of that device with the filter of Van Rijn to reach the present invention. Nor is there a motivation for any such combination. The multi-layer industrial filter structure of Ishii is a fundamentally different type of filter from the precision-shaped micron-scale filter membrane of the present invention suited for filtering biological suspensions. The Ishii filter has different objectives, different design criteria, and is for a different application in an entirely different industry.

Therefore, it is submitted that one skilled in the field would not combine or attempt to confirm the features of the Ishii patent with Van Rijn to reach the present invention. It is respectfully submitted that it is only with the improper use of hindsight, employing the present application as a blueprint or road map, that such a combination is even conceivable. As the Federal Circuit has made clear, however, obviousness cannot be based on combining isolated elements from various references where there is otherwise no teaching or suggestion of such a combination.

Further, even if one were to improperly pick or choose, from all the Ishii disclosure, the isolated idea of adhesive or heat fusing two layers together, and apply it to Van Rijn, the present invention still would not result. Ishii discloses adhesive or heat fusing two preformed layers of fundamentally different construction -- a coarse woven core and fibrous mat layers. Ishii clearly is not concerned with forming an integrated filter membrane and support structure that is monolithic, and has no apparent distinction between the layers. If the Ishii idea of adhesive or heat fusing two layers were applied to Van Rijn, the apparent result would be, at most, separately formed and cured filter and support layers, adhesively or heat fused with a visible line of distinction between them (which is little different from the disclosure in Van Rijn itself). In any event, the claimed invention would not be the result of such a combination.

For the above reasons it is submitted that the pending claims are not anticipated or rendered obvious in view of the cited references and that the rejection should be reconsidered and the claims allowed.

Reference to Co-Pending Application

Finally, applicant notes that in the cited references from previously submitted co-pending U.S. Provisional Application

Serial No. 60/169,714 has a line drawn through it. Applicant submitted a copy of this application in an effort to be thorough and to comply with the duty of disclosure. It is requested this application be noted by the Examiner.

In conclusion, it is respectfully requested for all the above reasons that the pending claims be reconsidered and allowed. Although no fee is believed necessary, if it is determined that fees are required, please charge Deposit Account No. 50/1039.

Respectfully submitted,

Date: July 26, 2002

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